



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

AGRICULTURAL SCIENCES P1

NOVEMBER 2015

MEMORANDUM

MARKS: 150

This memorandum consists of 9 pages.

SECTION A**QUESTION 1**

1.1	1.1.1	A ✓✓	(10 x 2)	(20)
	1.1.2	A ✓✓		
	1.1.3	C ✓✓		
	1.1.4	D ✓✓		
	1.1.5	C ✓✓		
	1.1.6	B ✓✓		
	1.1.7	B ✓✓		
	1.1.8	C ✓✓		
	1.1.9	B ✓✓		
	1.1.10	C/D ✓✓		
1.2	1.2.1	B only ✓✓	(5 x 2)	(10)
	1.2.2	A only ✓✓		
	1.2.3	Both A and B ✓✓		
	1.2.4	B only ✓✓		
	1.2.5	None ✓✓		
1.3	1.3.1	Bile ✓✓	(5 x 2)	(10)
	1.3.2	Insulation/ventilation ✓✓		
	1.3.3	Vector ✓✓		
	1.3.4	Dystocia ✓✓		
	1.3.5	Impotence ✓✓		
1.4	1.4.1	Fodder flow/feed flow ✓	(5 x 1)	(5)
	1.4.2	Free-range/semi intensive/backyard ✓		
	1.4.3	Per acute/acute ✓		
	1.4.4	Layers ✓		
	1.4.5	Mesoderm ✓		

TOTAL SECTION A: 45

SECTION B**QUESTION 2: ANIMAL NUTRITION****2.1 Diagram of a digestive system**

- 2.1.1 **Identify the type of farm animal**
Monogastric animal/non-ruminant animal ✓ (1)
- 2.1.2 **Motivation for QUESTION 2.1.1**
Monogastric/simple stomach ✓ (1)
- 2.1.3 **Identification of the letters**
(a) E ✓
(b) C ✓
(c) D ✓ (3)
- 2.1.4 **Reasons for NOT feeding roughage**
• Monogastric/simple stomach ✓
• No cellulose-digesting microbes/flora ✓
• Cannot digest roughage ✓ (Any 2) (2)

2.2 Water, vitamins and minerals

- 2.2.1 **Functions of water**
• Acts as a solvent/assists in the absorption of nutrients ✓
• Protects some sensitive tissue/serves as a lubricant ✓
• Moisturising the swallowed food/feed ✓
• Provides a suitable environment for microbes/flora ✓
• Mechanical digestion in mouth/swallowing ✓
• Prevents constipation ✓
• Assists in the transportation of nutrients ✓
• Excretion of waste products ✓ (Any 3) (3)
- 2.2.2 **Vitamin/mineral deficiencies**
(a) Vitamin D/Calcium/Ca/Phosphorus/P/Copper/Cu ✓
(b) Vitamin A/retinol ✓
(c) Iodine/I ✓
(d) Iron/Fe/Vitamin B₆/B₁₂/Copper/Cu/Cobalt/Co ✓ (4)

2.3 **Digestibility co-efficiency**

2.3.1 **Calculation:** 8% (0,08) x 30 kg = 2,4 kg
 Dry material: 30 kg - 2,4 kg = 27,6 kg ✓

$$DC = \frac{\text{Dry material intake (kg)} - \text{Dry mass of manure(kg)}}{\text{Dry material intake (kg)}} \times \frac{100}{1} \checkmark$$

$$= \frac{27,6 \text{ kg} - 12 \text{ kg}}{27,6 \text{ kg}} \times \frac{100}{1} \checkmark$$

$$= 56,5/57 \checkmark \% \checkmark \quad (5)$$

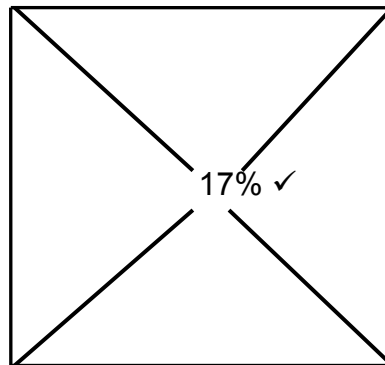
2.3.2 **Processes to improve digestibility of feeds**

- Mechanical processes/grinding/milling/crushing/rolling ✓
- Pelleting ✓
- Heating/roasting/boiling/cooking/steaming ✓
- Additives/supplementing with NPN/molasses/
treating feed with dilute caustic soda (NaOH) solution ✓
- Soaking ✓
- Popping and micronising ✓
- Mixing of complementary feeds ✓

(Any 3) (3)

2.4 **Pearson square**

2.4.1 **Calculation:** Maize 9% 27/27 parts ✓



Peanut oilcake 44% 8/8 parts ✓ (3)

2.4.2 **Maize percentage to be included in the ration**

$$27 \div 35 \times 100 \checkmark$$

$$= 77,14/77\% \checkmark$$

(2)

2.5 Feed and supplement supply

2.5.1 Months when there was sufficient veld fodder

- December ✓
- January ✓ (2)

2.5.2 Justification

- No supplementation during the two months ✓
- Only veld fodder was used during the two months ✓ (Any 1) (1)

2.5.3 Reasons for introducing a concentrate

- Animals are prepared/fattened/rounding off for the market ✓✓
- Getting animals ready for breeding ✓✓
- For the lambing season ✓✓
- Insufficient veld fodder ✓✓ (Any 1) (2)

2.5.4 Calculation of the fodder for January:

(a) 3,4 tons x 1 000 = 3 400 kg ✓ (1)

(b) 50 sheep x 2 kg intake per sheep x 31 days ✓
= 3 100 kg ✓ (2)
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QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

3.1 Production systems

3.1.1 Production systems

- A - Extensive ✓
- B - Intensive ✓ (2)

3.1.2 Comparison of the two systems

	Extensive/A	Intensive/B
Environment	No/limited/less control ✓	Environment is modified or controlled for production purposes ✓
Productivity	Low/less productivity ✓	High/more productivity ✓
Human input	Low/minimal/less ✓	High/more ✓

(6)

3.1.3 Reason for keeping cattle in the facility

- Higher productivity/output/efficiency ✓
- An environment for feeding/nutrition/protection/control ✓ (Any 1) (1)

3.2 **Farm animals loosing heat**

3.2.1 **Ways in which animals lose heat**

- A - Radiation/evaporation/perspiration ✓
- B - Conduction ✓
- C - Excretion/defecation ✓

(3)

3.2.2 **Other ways of heat loss**

- Convection ✓
- Movement/work ✓
- Production level ✓
- Urination ✓
- Breathing ✓

(Any 2) (2)

3.2.3 **Signs of heat stress in animals**

- Excessive salivation/drooling ✓
- Drop/decrease in production ✓
- Excessive panting/high respiratory rate/sweating ✓
- Open mouth breathing with tongue hanging out ✓
- Loss of appetite ✓
- Cattle move away from each other ✓
- Restlessness ✓

(Any 2) (2)

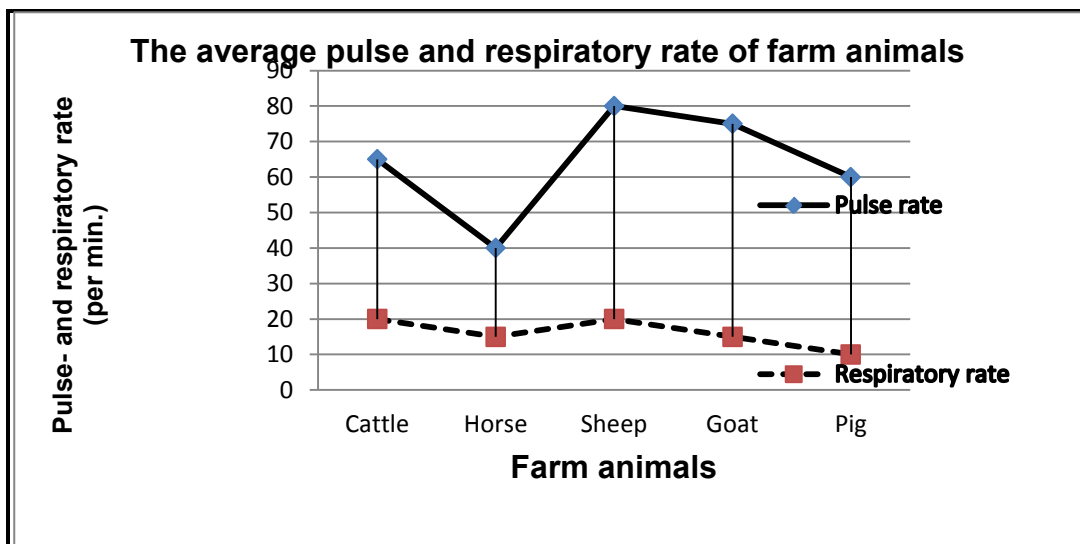
3.2.4 **Management practice to reduce heat in A**

- Provision of shelter/shade/cool area ✓
- Breeding of heat adapting animals ✓
- Use of mechanical cooling systems ✓
- Work calmly with animals ✓
- Access to drinking water ✓

(Any 2) (2)

3.3 **Pulse and respiratory rate of farm animals**

Line graph of the pulse and respiratory rate of farm animals



Mark allocations

- Correct heading ✓
 - Line graph ✓
 - X-axis correctly calibrated/labelled (Species of farm animals) ✓
 - Y-axis correctly calibrated/labelled (Pulse and respiratory rates) ✓
 - Accuracy/correct values/plotting/both graphs must be correct ✓
 - Correct units (per min.) ✓
- (6)

3.4 Vaccination plan**3.4.1 Appropriate words/terms for letters A to G**

- A** Anthrax ✓
- B** Cattle/sheep/goats ✓
- C** Protozoa ✓
- D** Cattle/sheep/goats ✓
- E** Blisters on the tongue/nose/lips/mouth/teats/udder/
between the toes/around hooves ✓
- F** Annually/once a year ✓
- G** Virus ✓
- (7)

3.4.2 Vector for redwater

- Ticks ✓
- (1)

3.5 Control of parasites**Appropriate method used to administer remedies**

- 3.5.1 Dosing/drenching/injecting/provision of licks ✓ (1)
- 3.5.2 Dipping/spraying/spot treatment/injecting ✓ (1)
- 3.5.3 Cleaning/apply ointments/medication/apply insecticides/dipping ✓ (1)
- [35]**

QUESTION 4: ANIMALREPRODUCTION**4.1 Embryo development****4.1.1 Stages of parturition as in pictures A and B**

- A** - Ejection/expulsion ✓
- B** - Preparatory ✓
- (2)

4.1.2 Incorrect posture of the calf

- Picture B/B ✓ (1)
- Reason**
- Retention of one leg towards the vulva/second leg is folded back ✓ (1)

- 4.1.3 **Letter that corresponds with the following activities**
- (a) B ✓ (1)
- (b) A ✓ (1)
- (c) A ✓ (1)

- 4.1.4 **Behavioural changes**
- Restlessness/walks around/in pain and discomfort ✓
 - Loss of appetite ✓
 - Isolation/nesting behaviour ✓
 - Tail raising ✓
 - Lows often/bellowing noises ✓
 - Frequent urination ✓
- (Any 3) (3)

4.2 **Graph that represents hormones in the oestrus cycle of a cow**

- 4.2.1 **Definition of oestrus cycle**
- Hormonally-controlled cycle of activity ✓
 - of the female reproductive organs ✓
- OR**
- Recurring periods of oestrus ✓
 - alternating with sexual rest in the matured female ✓ (Any 1) (2)

- 4.2.2 **Range of days in which progesterone level is the highest**
- From day 9/10 to day 15/16 (indicate any two days within the range) ✓ (1)

- 4.2.3 **Reason for the drop in the level of FSH between days 2 and 3**
- Oestrogen levels is at its peak/high/went up ✓ (1)

- 4.2.4 **Reason for the increased progesterone levels on days 3 and 4**
- Fertilisation has taken place ✓✓
- OR**
- Corpus luteum has been formed ✓✓ (Any 1) (2)

- 4.2.5 **Influence of oestrogen on LH**
- Oestrogen stimulates the release of LH ✓ (1)

- 4.2.6 **The structure where prolactin is produced**
- Pituitary gland/Hypophysis ✓ (1)

4.3 **Detection of oestrus**

The device to which each of the following statements apply:

- 4.3.1 Pedometer ✓ (1)
- 4.3.2 Chin-ball markers ✓ (1)
- 4.3.3 Tail-chalking ✓ (1)

4.4 Diagrams that represents a reproductive process

- 4.4.1 **Reproductive process**
 • Cloning/nuclear transfer ✓ (1)
- 4.4.2 **Definition of cloning**
 • A process through which an identical copy of the donor animal is produced ✓
 • from its nucleus ✓ (2)
- 4.4.3 **Description of stage B**
 • Removal of the nucleus ✓ (1)
- 4.4.4 **Aims of cloning**
 • Produce large numbers of genetically identical animals ✓
 • Production of offspring from a higher quality animal ✓
 • Preservation of superior genetics/characteristics ✓
 • Increase the population size of endangered species ✓
 • Achieve high quality meat and dairy products ✓
 • For medical purposes ✓ (Any 3) (3)

4.5 Diagram on oogenesis

- 4.5.1 **Type of process**
 Oogenesis/ovogenesis ✓ (1)
- 4.5.2 **Type of cell division**
 Mitosis ✓ (1)
- 4.5.3 **Explanation for meiotic division**
 To form haploid cells/gametes ✓ (1)
- 4.5.4 **End products of division of oogenesis and spermatogenesis**
 (a) Ova/egg cells ✓ (1)
 (b) Spermatozoa/sperm cells ✓ (1)
- 4.5.5 **The organ where the following are found**
 (a) Testis ✓ (1)
 (b) Ovary ✓ (1)

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TOTAL SECTION B: 105
GRAND TOTAL: 150